Complete Summary

GUIDELINE TITLE

ACR Appropriateness Criteria® jaundice.

BIBLIOGRAPHIC SOURCE(S)

Foley WD, Bree RL, Rosen MP, Gay SB, Grant TH, Heiken JP, Huprich JE, Lalani T, Miller FH, Sudakoff GS, Greene FL, Rockey DC, Expert Panel on Gastrointestinal Imaging. ACR Appropriateness Criteria® jaundice. [online publication]. Reston (VA): American College of Radiology (ACR); 2008. 7 p. [27 references]

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Foley WD, Bree RL, Gay SB, Glick SN, Heiken JP, Huprich JE, Levine MS, Ros PR, Rosen MP, Shuman WP, Greene FL, Expert Panel on Gastrointestinal Imaging. Jaundice. [online publication]. Reston (VA): American College of Radiology (ACR); 2005. 6 p. [24 references]

The appropriateness criteria are reviewed annually and updated by the panels as needed, depending on introduction of new and highly significant scientific evidence.

COMPLETE SUMMARY CONTENT

SCOPE

METHODOLOGY - including Rating Scheme and Cost Analysis RECOMMENDATIONS

EVIDENCE SUPPORTING THE RECOMMENDATIONS

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS OUALIFYING STATEMENTS

IMPLEMENTATION OF THE GUIDELINE

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IDENTIFYING INFORMATION AND AVAILABILITY DISCLAIMER

SCOPE

DISEASE/CONDITION(S)

Jaundice

GUIDELINE CATEGORY

Diagnosis Evaluation

CLINICAL SPECIALTY

Family Practice Gastroenterology Hematology Internal Medicine Nuclear Medicine Oncology Radiology

INTENDED USERS

Health Plans
Hospitals
Managed Care Organizations
Physicians
Utilization Management

GUIDELINE OBJECTIVE(S)

To evaluate the appropriateness of initial radiologic examinations for patients with jaundice

TARGET POPULATION

Patients with jaundice

INTERVENTIONS AND PRACTICES CONSIDERED

- 1. Abdominal ultrasound (US)
- 2. Computed tomography (CT), abdomen, with and without contrast
- 3. Magnetic resonance imaging (MRI), abdomen, with or without contrast with magnetic resonance cholangiopancreatography (MRCP)
- 4. Invasive
 - Endoscopic retrograde cholangiopancreatography (ERCP)
 - Percutaneous transhepatic cholangiography (PTC)
- 5. Nuclear medicine (NUC), cholescintigraphy (considered but not recommended)

MAJOR OUTCOMES CONSIDERED

Utility of radiologic examinations in differential diagnosis

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The guideline developer performed literature searches of peer-reviewed medical journals, and the major applicable articles were identified and collected.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Not Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not stated

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

One or two topic leaders within a panel assume the responsibility of developing an evidence table for each clinical condition, based on analysis of the current literature. These tables serve as a basis for developing a narrative specific to each clinical condition.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus (Delphi)

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Since data available from existing scientific studies are usually insufficient for meta-analysis, broad-based consensus techniques are needed for reaching agreement in the formulation of the appropriateness criteria. The American College of Radiology (ACR) Appropriateness Criteria panels use a modified Delphi technique to arrive at consensus. Serial surveys are conducted by distributing questionnaires to consolidate expert opinions within each panel. These questionnaires are distributed to the participants along with the evidence table and narrative as developed by the topic leader(s). Questionnaires are completed by the participants in their own professional setting without influence of the other members. Voting is conducted using a scoring system from 1 to 9, indicating the least to the most appropriate imaging examination or therapeutic procedure. The survey results are collected, tabulated in anonymous fashion, and redistributed

after each round. A maximum of three rounds is conducted and opinions are unified to the highest degree possible. Eighty percent agreement is considered a consensus. This modified Delphi technique enables individual, unbiased expression, is economical, easy to understand, and relatively simple to conduct.

If consensus cannot be reached by this Delphi technique, the panel is convened and group consensus techniques are utilized. The strengths and weaknesses of each test or procedure are discussed and consensus reached whenever possible. If "No consensus" appears in the rating column, reasons for this decision are added to the comment sections.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

ACR Appropriateness Criteria®

Clinical Condition: Jaundice

Variant 1: Acute abdominal pain; at least one of the following: fever, history of biliary surgery, known cholelithiasis.

Radiologic Procedure	Rating	Comments	RRL*
US abdomen	9		None
CT abdomen without and with contrast	7		High
MRI abdomen	5	If cholangitis or hepatic abscess is	None

Radiologic Procedure	Rating	Comments	RRL*
without contrast with MRCP		suspected, with contrast is preferred.	
INV ERCP	4	If high suspicion of common bile duct stones, some would advocate doing ERCP initially.	Med
NUC cholescintigraphy	2		Low
Rating Scale: 1=Least appropriate, 9=Most appropriate			*Relative Radiation Level

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 2: Painless; one or more of the following: weight loss, fatigue, anorexia, duration of symptoms greater than 3 months. Patient otherwise healthy.

Radiologic Procedure	Rating	Comments	RRL*
CT abdomen without and with contrast	9	Dynamic, multiplanar, or helical.	High
US abdomen	8		None
MRI abdomen with contrast with MRCP	7	See comments regarding contrast in the text below under "Anticipated Exceptions."	None
INV ERCP	6		Med
INV PTC	4		IP
			*Relative Radiation Level

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 3: Painless; one or more of the following: weight loss, fatigue, anorexia, duration of symptoms greater than 3 months. Patient will not tolerate radical surgical procedure.

Radiologic Procedure	Rating	Comments	RRL*
CT abdomen without and with contrast	9	Dynamic multiplanar or helical	High
US abdomen	8		None
MRI abdomen with contrast with MRCP	7	See comments regarding contrast in the text below under "Anticipated Exceptions."	None
INV ERCP	6	Not as an initial test. Would do imaging study first.	Med
INV PTC	5		IP
NUC cholescintigraphy	2		Low
Rating Scale: 1=Least appropriate, 9=Most appropriate			*Relative Radiation Level

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 4: Clinical condition and laboratory examination makes mechanical obstruction unlikely.

Radiologic Procedure	Rating	Comments	RRL*
US abdomen	8		None
MRI abdomen with or without contrast with MRCP	6	See comments regarding contrast in the text below under "Anticipated Exceptions."	None
CT abdomen with or without contrast	5		Med
INV ERCP	3		Med
NUC cholescintigraphy	3		Low
INV PTC	2		IP
Rating Scale: 1=Least appropriate, 9=Most appropriate			*Relative Radiation Level

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 5: Confusing clinical picture; patient not described in previous scenarios.

Radiologic Procedure	Rating	Comments	RRL*
US abdomen	8		None
CT abdomen with and without contrast	7		Med
MRI abdomen with and without contrast	6	See comments regarding contrast in the text below under "Anticipated Exceptions."	None
INV ERCP	5		Med
Rating Scale: 1=Least appropriate, 9=Most appropriate			*Relative Radiation Level

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Summary of Literature Review

One of the difficulties in determining a rational imaging strategy to evaluate jaundiced patients stems from the fact that jaundice is a clinical finding, not a single disease entity. The causes of nonhemolytic jaundice can be divided into two distinct categories: intrahepatic biliary stasis (hepatocellular jaundice) and mechanical biliary obstruction.

Because imaging plays little useful role in the evaluation of intrahepatic biliary stasis, the first task of the clinician caring for the jaundiced patient is to determine if jaundice is caused by bile duct obstruction. Several studies have shown that this distinction can be made in approximately 85% of patients using only clinical findings (age, nutritional status, pain, systemic symptoms, stigmata of liver disease, palpable liver or gallbladder) and simple biochemical tests. Patients with a high pretest probability of nonobstructive jaundice usually have either diffuse hepatocellular disease (e.g., cirrhosis, hepatitis), or, more rarely, inability of the liver to handle a bilirubin load (e.g., hemolytic anemia), or a metabolic deficiency (Gilbert's disease). These patients need no imaging studies. Instead, percutaneous needle liver biopsy is often the next step.

Obstructive jaundice is jaundice resulting from obstruction to the flow of bile from the liver to the duodenum. In adults, extrahepatic (mechanical) obstruction accounts for 40% of patients presenting with jaundice as the primary symptom, and this likelihood increases with advancing age. The most common causes of

obstructive jaundice in the United States are neoplasms of the pancreas, ampulla of Vater or biliary tract, choledocholithiasis, pancreatitis, and iatrogenic strictures of the biliary tree. Other less common causes include tumors metastatic to the biliary epithelium, sclerosing cholangitis, and other causes of cholangitis. Other less common causes include tumors metastatic to the biliary epithelium, sclerosing cholangitis, hepatic tumors adjacent to the hilum, perihepatic lymphadenopathy, and other causes of cholangitis.

Imaging Methods

Radiographs

Radiographs rarely provide any information on the site or the cause of obstruction and have no place in the evaluation of the jaundiced patient.

The methods used in evaluating the jaundiced patient today include ultrasound (US), computed tomography (CT), radionuclide cholescintigraphy (CS), magnetic resonance cholangiopancreatography (MRCP), percutaneous transhepatic cholangiography (PTC), and endoscopic retrograde cholangiopancreatography (ERCP). These examinations are effective to varying degrees in assessing both the cause and the site of obstruction; ERCP also can relieve the obstruction in a significant portion of cases.

The literature is replete with articles confirming the usefulness of all of these methods. Comparative studies have rarely considered the effect of factors that may influence the validity of their conclusions. Among these factors are the prevalence of extrahepatic obstruction in the population studied, the various causes of obstruction (case mix) in the series (often a function of institutional bias), and the frequency of uninterruptible results or unsuccessful studies. These factors can have a profound influence on apparent differences in efficacy. In designing appropriateness criteria, therefore, the guideline developers have chosen to consider strategies in terms of the pretest probability that, if present, the obstruction is more likely benign than malignant.

It must be remembered that the results of any given imaging method strongly depend on the population studied and the expertise of the examiners. For this reason, local conditions and expertise should properly influence the method by which jaundiced patients are evaluated.

Cholescintigraphy

Cholescintigraphy is unreliable in differentiating intrahepatic cholestasis from obstructive jaundice and in depicting either the site or cause of obstruction, and CS is no longer routinely used or recommended in the evaluation of jaundice.

Ultrasound

US is the least invasive and lowest cost imaging technique available for evaluating obstructive jaundice. US determines the presence of obstructive jaundice by detecting dilated bile ducts, with sensitivity of 55% to 95% and specificity of 71% to 96%. False-negative studies are due to two factors: inability to see the

extrahepatic biliary tree (often because of interposed bowel gas), and the absence of biliary dilation in the presence of obstruction. US is less effective than CT or direct cholangiography (either PTC or ERCP) in determining the site and the cause of obstruction.

Computed Tomography

CT is slightly more sensitive (74% to 96%) and specific (90% to 94%) than US in detecting the presence of biliary obstruction; in addition, the ability to determine the site and the cause of obstruction is greater with CT than with US. CT is strongly recommended as the primary modality for evaluating patients with suspected malignant biliary obstruction, both for diagnosis and for staging. CT cholangiopancreatography generated by slab volume imaging with minimum-intensity projections and curved planar reformations may be useful for preintervention planning.

Magnetic Resonance Imaging

Magnetic resonance imaging (MRI) can demonstrate both the site and cause of biliary obstruction. MR cholangiography has been shown to be useful in depicting the three-dimensional anatomy of the biliary and pancreatic ducts. For detection of ductal calculi, MRCP is the most sensitive of the noninvasive techniques. The use of MRCP may decrease the number of ERCP studies obtained prior to elective cholecystectomy. More recent studies have recommended MRCP as the preferred test in patients with a high likelihood of choledocholithiasis. MRCP is valuable in the clinical situation of failed ERCP and in patients with hilar biliary obstruction due to ductal tumor or periductal compression.

Percutaneous Transhepatic Cholangiography (PTC)

PTC permits visualization of the intrahepatic and extrahepatic biliary tree to diagnose the etiology of jaundice, and it also allows therapeutic intervention if biliary obstruction is found. Its success rate depends on the prevalence of biliary obstruction. If obstruction is found, success is on the order of 90% to 99%. The sensitivity and specificity for the presence of obstructive jaundice are high, but the procedure is invasive, with major complications in 3% to 5% of patients; it is also more expensive than CT or US.

Endoscopic Retrograde Cholangiopancreatography

ERCP is the most common invasive diagnostic biliary procedure. It requires a skilled endoscopist and has a lower success rate than PTC and the other modalities; it is also the most expensive procedure described in these criteria. On the other hand, its complication rate is lower than or equal to that of PTC, and it provides a greater range and ease of therapeutic options for relief of the obstruction (stone extraction, internal biliary stent placement, etc). Its ability to give specific information about the site and cause of obstruction is similar to that of PTC. Both ERCP and PTC enable directed brushing and/or fine needle aspiration (FNA) for tissue diagnosis.

Endoscopic Ultrasound

Endoscopic ultrasound (EUS), an adjunct procedure to ERCP, can be used to detect small distal biliary ductal calculi, for local staging of periampullary neoplasm, and for guided FNA. In patients with a high likelihood of biliary stone disease, MRCP, rather than EUS, is recommended.

The relative role of ERCP in diagnostic and therapeutic medicine of biliary tract disease—specifically calculus disease, pancreatitis, and neoplastic obstruction—is well summarized in a "state of the science" consensus statement developed by the National Institutes of Health.

Appropriateness Criteria

To determine the appropriateness of any imaging test, it is necessary to consider the general clinical category to which the patient belongs. The major categories are (1) high likelihood of mechanical obstruction; (2) low likelihood of mechanical obstruction; and (3) indeterminate. For situations in which the pre-imaging probability for obstruction is high, it is also appropriate to consider a secondary question: whether the obstruction is likely to be benign or malignant.

Situation 1A: High Likelihood of Benign Biliary Obstruction

Patients in this category present with jaundice and acute abdominal pain. There may be a prior history of gallstones documented by sonography or of prior biliary surgery. Sonography is an accurate and the least expensive method for detecting dilated intrahepatic bile ducts and the common hepatic duct at the hepatic hilum. Biliary ductal calculi are not detected with the same sensitivity as gallbladder calculi. The subhepatic common duct may not be visible due to overlaying bowel gas. In addition, intrahepatic bile ducts may not be dilated in the early phase of acute obstruction or in patients with partial obstruction. Despite recognized limitations, sonography is recommended as the initial diagnostic test in patients with suspected calculus obstruction of the common duct.

In patients with acute biliary obstruction and suspected complicating conditions such as cholangitis, cholecystitis or pancreatitis not well evaluated by sonography, a preintravenous and postintravenous contrast-enhanced abdominal CT study is useful in defining the level of obstruction, likely cause, and coexistent complications. CT can detect partially calcified biliary calculi, but is relatively insensitive in detecting bilirubinate or cholesterol calculi.

MRCP and ERCP are equivalently sensitive for detecting biliary ductal calculi. The use of MRCP will improve the therapeutic yield of ERCP. Endoscopic sphincterotomy and associated therapeutic interventions may be curative. In patients with previous gastroenteric anastomoses, MRCP is recommended as the technique of choice to evaluate the extrahepatic biliary ductal system.

In patients with suspected sclerosing cholangitis or biliary stricture, MRCP is the preferred imaging test, avoiding the possibility of suppurative cholangitis that may be induced by endoscopic catheter manipulation of an obstructed biliary system. MRCP findings may guide directed approaches such as ERCP with brushing, percutaneous transhepatic biliary stenting, or reconstructive surgery.

Situation 1B: High Likelihood of Malignant Biliary Obstruction

Patients in this category typically present with insidious development of jaundice and associated constitutional symptoms (weight loss, fatigue, etc.). Mechanical biliary obstruction can be confirmed by sonography. Malignant obstruction is most commonly due to pancreatic carcinoma but may be secondary to cholangiocarcinoma of either the proximal or distal duct or to periductal nodal compression. A contrast-enhanced multipass CT examination with multiplanar reformation has high sensitivity to lesion detection and 70% accuracy in discriminating resectable and unresectable disease. Important information in tumor staging includes tumor contiguity or invasion of the superior mesenteric and portal vein, peripancreatic tumor extension, regional adenopathy, and hepatic metastases. Contrast-enhanced multipass CT has 70% accuracy in tumor staging.

MRI and MRCP are also accurate in tumor detection and staging. There are no large comparative studies of state-of-the-art CT and MRI in the evaluation of malignant biliary obstruction. CT is generally more available and more frequently used, with MRI/MRCP reserved for patients with contraindications to CT.

ERCP is invasive and more expensive than CT or MRI and has equivalent sensitivity in tumor detection, but does not provide staging information for operability. Tissue diagnosis can be obtained by endoscopically directed brushing or guided ultrasound (US) with fine needle aspiration (FNA). In patients with pancreaticobiliary cancer who are surgical candidates, there is no established role for preoperative biliary drainage by ERCP. However, endoscopic biliary drainage may be used for operative candidates in whom there is delay prior to surgery. Endoscopic or percutaneous transhepatic biliary drainage is appropriate for patients who are not candidates for surgery, the percutaneous transhepatic technique being preferred for patients with hilar biliary obstruction.

In patients with suspected malignant biliary obstruction and negative or equivocal CT or MRI studies, ERCP with EUS may provide an imaging and cytologic diagnosis (FNA).

Pathological tumor diagnosis in nonoperative candidates can be obtained either by EUS-directed brushing or FNA, by US- or CT-directed percutaneous pancreatic or nodal aspiration or core biopsy, or by fluoroscopically guided brushing or FNA (PTC).

Focal chronic pancreatitis may mimic pancreatic carcinoma on all imaging tests and only be conclusively diagnosed on operative exploration and biopsy.

Periductal nodal compression may result from metastatic disease or malignant lymphoma. Diagnosis is usually based on imaging appearances and clinical history. Tissue confirmation may be obtained by imaging-directed percutaneous biopsy.

Situation 2: Low Likelihood of Mechanical Biliary Obstruction

In situations in which the pre-test probability of obstruction is low but concern about the possibility exists, either US or MRCP is the first-line test, because of

patient convenience and low complication rates. MRCP findings are likely to be accepted without proceeding to ERCP or PTC. Of the two, UT is less expensive, though less definitive.

Situation 3: Indeterminate Likelihood of Obstruction

In this clinical situation, the patient's presentation is confusing, and the imaging work-up frequently is geared to the dominant clinical symptom. US is an inexpensive, relatively accurate method, certainly appropriate if the sole question is whether or not obstruction exists. In cases in which most of the abdominal organs need to be assessed, either CT or MRI can be used, though CT more reliably displays all abdominal anatomy. When CT evaluation is compromised (e.g., in patients unable to receive iodinated intravenous contrast material), the combination of MRI and MRCP is a reliable alternative.

Summary

In summary, the diagnostic approach for adults presenting with jaundice depends to a large extent on (a) the pre-imaging probability that jaundice is obstructive rather than nonobstructive; (b) the pre-test probability that the most likely cause is benign versus malignant; and (c) whether the patient is an operative candidate, once the diagnosis is made. Lastly, the availability of each possible modality and the expertise with which it is offered are important considerations in any clinical situation.

Anticipated Exceptions

Nephrogenic systemic fibrosis (NSF, also known as nephrogenic fibrosing dermopathy) was first identified in 1997 and has recently generated substantial concern among radiologists, referring doctors and lay people. Until the last few years, gadolinium-based MR contrast agents were widely believed to be almost universally well tolerated, extremely safe and non-nephrotoxic, even when used in patients with impaired renal function. All available experience suggests that these agents remain generally very safe, but recently some patients with renal failure who have been exposed to gadolinium contrast agents (the percentage is unclear) have developed NSF, a syndrome that can be fatal. Further studies are necessary to determine what the exact relationships are between gadolinium-containing contrast agents, their specific components and stoichiometry, patient renal function and NSF. Current theory links the development of NSF to the administration of relatively high doses (e.g., >0.2mM/kg) and to agents in which the gadolinium is least strongly chelated. The U.S. Food and Drug Administration (FDA) has recently issued a "black box" warning concerning these contrast agents (http://www.fda.gov/cder/drug/InfoSheets/HCP/gcca 200705HCP.pdf).

This warning recommends that, until further information is available, gadolinium contrast agents should not be administered to patients with either acute or significant chronic kidney disease (estimated glomerular filtration rate [GFR] <30 mL/min/1.73m²), recent liver or kidney transplant or hepato-renal syndrome, unless a risk-benefit assessment suggests that the benefit of administration in the particular patient clearly outweighs the potential risk(s).

Abbreviations

- CT, computed tomography
- ERCP, endoscopic retrograde cholangiopancreatography
- INV, invasive
- IP, in progress
- Med, medium
- MRCP, magnetic resonance cholangiopancreatography
- MRI, magnetic resonance imaging
- NUC, nuclear medicine
- PTC, percutaneous transhepatic cholangiography
- US, ultrasound

Relative Radiation Level*	Effective Dose Estimated Range
None	0
Minimal	<0.1 mSv
Low	0.1-1 mSv
Medium	1-10 mSv
High	10-100 mSv

^{*}RRL assignments are not included for some examinations. The RRL assignments for the IP (in progress) exams will be available in future releases.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The recommendations are based on analysis of the current literature and expert panel consensus.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Selection of appropriate radiologic imaging procedures for evaluation of patients with jaundice

POTENTIAL HARMS

- Percutaneous transhepatic cholangiography is an invasive procedure with reported major complications in the 3%-5% range.
- The complication rate with endoscopic retrograde cholangiopancreatography is lower than or equal to percutaneous transhepatic cholangiography (PTC).

- False-positive and false-negative results of imaging studies.
- Potential adverse health effects associated with radiation exposure are an important factor to consider when selecting the appropriate imaging procedure. Because there is a wide range of radiation exposures associated with different diagnostic procedures, a relative radiation level (RRL) indication has been included for each imaging examination. The relative radiation levels are based on effective dose, which is a radiation dose quantity that is used to estimate population total radiation risk associated with an imaging procedure. Additional information regarding radiation dose assessment for imaging examinations can be found in the American College of Radiology (ACR) Appropriateness Criteria® Radiation Dose Assessment Introduction document (see "Availability of Companion Documents" field).
- Recently some patients with renal failure who have been exposed to gadolinium contrast agents (the percentage is unclear) have developed nephrogenic systemic fibrosis (NSF), a syndrome that can be fatal. The U.S. Food and Drug Administration (FDA) has recently issued a "black box" warning concerning these contrast agents. This warning recommends that, until further information is available, gadolinium contrast agents should not be administered to patients with either acute or significant chronic kidney disease (estimated glomerular filtration rate [GFR] <30 mL/min/1.73m²), recent liver or kidney transplant or hepato-renal syndrome, unless a risk-benefit assessment suggests that the benefit of administration in the particular patient clearly outweighs the potential risk(s).

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

An American College of Radiology (ACR) Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those exams generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the U.S. Food and Drug Administration (FDA) have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Personal Digital Assistant (PDA) Downloads

For information about <u>availability</u>, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Foley WD, Bree RL, Rosen MP, Gay SB, Grant TH, Heiken JP, Huprich JE, Lalani T, Miller FH, Sudakoff GS, Greene FL, Rockey DC, Expert Panel on Gastrointestinal Imaging. ACR Appropriateness Criteria® jaundice. [online publication]. Reston (VA): American College of Radiology (ACR); 2008. 7 p. [27 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

1996 (revised 2008)

GUIDELINE DEVELOPER(S)

American College of Radiology - Medical Specialty Society

SOURCE(S) OF FUNDING

The American College of Radiology (ACR) provided the funding and the resources for these ACR Appropriateness Criteria®.

GUIDELINE COMMITTEE

Committee on Appropriateness Criteria, Expert Panel on Gastrointestinal Imaging

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Panel Members: W. Dennis Foley, MD; Robert L. Bree, MD, MHSA; Max Paul Rosen, MD, MPH; Spencer B. Gay, MD; Thomas H. Grant, DO; Jay P. Heiken, MD; James E. Huprich, MD; Tasneem Lalani, MD; Frank H. Miller, MD; Gary S. Sudakoff, MD; Frederick L. Greene, MD; Don C. Rockey, MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Foley WD, Bree RL, Gay SB, Glick SN, Heiken JP, Huprich JE, Levine MS, Ros PR, Rosen MP, Shuman WP, Greene FL, Expert Panel on Gastrointestinal Imaging. Jaundice. [online publication]. Reston (VA): American College of Radiology (ACR); 2005. 6 p. [24 references]

The appropriateness criteria are reviewed annually and updated by the panels as needed, depending on introduction of new and highly significant scientific evidence.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the American College of Radiology (ACR) Web site.

ACR Appropriateness Criteria® *Anytime*, *Anywhere*^{$\intercal M$} (PDA application). Available from the ACR Web site.

Print copies: Available from the American College of Radiology, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- ACR Appropriateness Criteria®. Background and development. Reston (VA): American College of Radiology; 2 p. Electronic copies: Available in Portable Document Format (PDF) from the <u>American College of Radiology (ACR) Web site</u>.
- ACR Appropriateness Criteria® radiation dose assessment introduction. American College of Radiology. 2 p. Electronic copies: Available from the American College of Radiology Web site.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on March 19, 2001. The information was verified by the guideline developer on March 29, 2001. This NGC summary was updated by ECRI on January 26, 2006. This NGC summary was updated by ECRI Institute on June 23, 2009.

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Date Modified: 7/27/2009

